68 67 67 68
125. The method of claim 124, wherein the user data portion of the individual sectors has a capacity of substantially 512 bytes.

69 64 67 65
126. The method of claim 124, wherein the overhead data stored in said overhead portion of the individual sectors includes addresses of the individual sectors.

70 65 67 62
127. The method of claim 124, wherein partitioning the memory cells includes partitioning said memory cells within the individual sectors to include an additional portion of spare memory cells.

71 66 71 70 65
128. The method of claim 127, wherein the overhead data stored in said overhead portion of the individual sectors includes an identification of any defective cells within the user data portion of corresponding ones of said sectors, said method additionally comprising causing the controller to read the identification of defective cells from the overhead portion of said addressed at least one non-volatile memory sector and then to substitute therefore other cells within the spare cell portion of the addressed at least one non-volatile memory sector.

72 67 67 62
129. The method of claim 124, additionally comprising causing the controller to identify and store addresses of any defective non-volatile memory sectors within the array, and, wherein designating an address of a sector includes, in response to designating an address of a defective sector, substituting an address of another sector instead.

73 68 67 68
130. The method of claim 124, wherein the individual sectors include only one user data portion and only one overhead data portion.--

REMARKS

With regard to the objection to the specification in paragraph 1 of the Office Action, the handwritten addition to page 5, lines 11 and 12 should be ignored. It is not an initialed change. Rather, it is a note made on the file copy of the parent application maintained undersigned attorney that should have been removed before filing the present continuation application. The undersigned attorney apologizes for any inconvenience caused by not having done so.

Claim Rejections Under 35 U.S.C. 112, 2nd¶

With regard to the rejections of many of the claims under 35 U.S.C. 112, second paragraph, many amendments have been made in order to address the alleged indefiniteness in the claims. An amendment has been made in response to each of the listed objections to the claims

except for the objection to dependent claim 93. Reconsideration of this rejection is requested. Claim 93 appears to quite clearly state that user data and corresponding overhead data are stored together in an individual location of the array. If the Examiner continues to be concerned with claim 93, the undersigned attorney would appreciate an opportunity to discuss it with him.

Rejection of Claims 63-81 Under 35 U.S.C. 103

Reconsideration of the rejection of claims 63-81 under 35 U.S.C. 103 is respectfully requested in light of claim amendments being made and these Remarks. Independent claim 63, and thus also each of its dependent claims 64-81, recites a method of operating a bulk storage memory that responds to a block addressing scheme of a host processor to address corresponding groups of cells of a non-volatile floating gate memory cell array. Overhead data associated either with a particular group of cells or with user data stored in a group of cells, is specified to be generated within the bulk storage memory and stored in the group of cells. This combination is not suggested by the cited references. Particularly, there is no suggestion of storing overhead data in the floating gate memory array as part of the groups of cells to which the overhead data pertain. The specific language of method claim 63 is not discussed in the Office Action but rather claim 63 is summarily rejected (page 14, ¶10) by reference to the reasons given for rejecting the different system independent claim 82.

The Office Action (middle of each of pages 4 & 5) alleges that the Burke Australian patent publication no. 22536/83 "inherently" stores such overhead data, referring to the second edition of a book by Lai on device drivers, including those for RAM disks, that is not of record in this applicaiton. Indeed, an inquiry by the undersigned attorney has revealed that the second edition was published in 1992, long after the 1989 effective filing date of the present application. No *prima facie* case has been made that the Burke reference "inherently" discloses the inclusion of overhead data as part of the groups of array cells in the manner defined in claim 63.

The Office Action (page 7) also relies upon the use of defect tables in magnetic disk drive data storage media systems as apparently suggesting the storage of overhead data within defined user data storing floating gate memory cell groups, citing U.S. patent no. 4,498,146 to Martinez. It is submitted, however, that adoption of such disk drive overhead data techniques in operating floating gate non-volatile memory would not have been an obvious thing to do. Because magnetic media disk memory and floating gate memory arrays have such different operating characteristics, they have historically been operated much differently. Indeed, none of the references discussed in the Office Action suggest applying magnetic disk memory system techniques to the operation of floating gate memory.

This non-obviousness becomes even greater as more details of the floating gate memory are specified. For example, each of the dependent claims 78-81 recites that erasure of an

individual group of floating gate memory cells simultaneously erases both the user and overhead data stored in that group of cells. This is totally contrary to operation of a magnetic disk storage system, such as that described in the cited Martinez reference, where reference tables are maintained. It is therefore respectfully submitted that the rejection of dependent claims 78-81 as obvious over a combination of *five* different references, on the same basis as claim 94 (see page 15 of the Office Action), is not well taken.

Rejection of Claims 82-94 Under 35 U.S.C. 103

Reconsideration of the rejection of independent claim 82 and its dependent claims 83-94, all under 35 U.S.C. 103, is also respectfully requested, for the same reasons expressed above with respect to the method claims 63-81. The grounds of rejection of claims 63-81 are referenced in the Office Action to those of claims 82-94, so the above discussion responds to the common rejections of both sets of claims.

Use of Official Notice as Evidence of Prior Art

In formulating the obviousness rejections of certain claims, the Office Action relies upon certain facts without referring to a cited reference. Although the claims are believed to be patentable in any event, for the reasons stated above, an objection is being raised to the assumption of these facts in order to make clear that Applicants are not necessarily acquiescing in their accuracy.

These summarily stated facts appear at the following locations of the Office Action: pp. 7 & 8, all of subpara. 3a(vi); pp. 8 & 9, all of subpara. 3c; p. 9, subparas. 4a(ii) & 4a(iii); p. 10, all of subpara. 5a; p. 11, all of subpara. 6a(iii); p. 12, subpara. 8a; and pp. 13 & 14, subpara. 9a(v).

New Claims 95-130

Dependent claims 95-100 and 107-110 being added by this Amendment are directed to operating the memory with two states per cell, in order to store exactly one bit of data per cell. New dependent claims 101-106 and 111-114 recite operating the memory to store more than one bit per cell, by operating the individual cells at more than two states ("multi-state"). Although multi-state operation is mentioned in the present application specification, it is more completely discussed in two applications incorporated by reference into the specification at pages 11, 22 and 26. Since the referenced application serial no. 204,175 has issued as patent no. 5,095,344, the patent number is being added by this Amendment. The serial number of the second referenced application is also being added by this Amendment. The status of the second referenced application is that it has become abandoned in favor of a continuation-in-part application which matured into patent no. 5,172,338 and a division thereof into patent no. 5,163,021. Copies of these three patents either have been, or are being, filed as part of Information Disclosure Statements submitted in the present application.

New claims 115-130 being added by this Amendment are the same as claims 1-16 of parent patent no. 5,602,987, respectively, but with a last paragraph added to claim multi-state

operation. Since these new claims are narrower than those already granted in the parent patent, they are also patentable and should be allowed. It will be noted that each of claims 115-130 recite the storage of overhead data along with user data in individual sectors of an array of non-volatile floating gate memory cells.
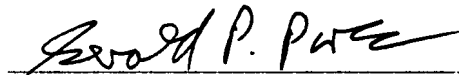
Information Disclosure Statements

One Information Disclosure Statement filed in the present application has not yet been considered, the one mailed April 9, 1998, after the outstanding Office Action was mailed. Another Information Disclosure Statement is being prepared and will be mailed separately from the filing of this Amendment a few days later. Consideration of each of the references listed on their form 1449s, and the making of them of record in the file of the present application, are respectfully requested.

Conclusion

For the reasons given above, it is respectfully submitted that all of claims 63-130 in the present application are allowable. An early indication of the allowance of this application is solicited.

Dated: September 8, 1998   Respectfully submitted,

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